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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/956,991	10/23/97	KORENBERG	J P-CE-2817

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EXAMINER

TUNG, M

ART UNIT	PAPER NUMBER
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1644

DATE MAILED:

08/16/99

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
08/956,991

Applicant(s)
Korenberg

Examiner
Mary Tung

Group Art Unit
1644



☒ Responsive to communication(s) filed on May 20, 1999

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 1-30 is/are pending in the application.

Of the above, claim(s) 11, 13-19, and 21-29 is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-10, 12, 20, and 30 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____.

☒ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 1 & 6

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

DETAILED ACTION

Election/Restriction

1. Applicant's election with traverse of Group I, claims 1-20, 12, 20 and 30 in Paper No. 14 is acknowledged. The traversal is on the ground(s) that the restriction requirement be modified to combine Groups I and VI together. The Applicants argue that the "claims of Groups I and VI are commonly drawn to methods of identifying nucleic acid comprising hybridization or DNA amplification steps" and "that for one to properly search the subject matter of the claims of Group VI, one would necessarily have to search art relating to the subject matter of the claims of Group I." The arguments are not found persuasive because the basis of the rejection is that Groups I and VI are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (M.P.E.P. 806.05(h)). In the present case, the product as claimed, the nucleic acid can be used in a diagnostic *in situ* hybridization assay, for example. Additionally, the search of Group I would not necessarily reveal art from the other, as evidenced by the different subclasses of the two Groups. The statement in the paper mailed 12/21/98 that Group I encompassed a "method for detecting said polynucleotide by hybridization and PCR amplification of said nucleotide sequence" was inadvertent and does not alter the restriction requirement.
2. Groups II-VII, claims 11, 13-19 and 21-29 are withdrawn from further consideration by the Examiner, 37 C.F.R. 1.142(b), as being drawn to non-elected inventions.
3. Applicant has further elected in Paper No. 14, the species of SEQ ID NO: 1. Claims 1-20, 12, 20 and 30 are readable on the elected species. Claims 11, 13-19 and 21-29 are patentably distinct and are accordingly held to be withdrawn from further consideration under 37 C.F.R. 1.142(b).
4. The requirement is still deemed proper and is therefore made FINAL.

Specification

5. The use of the trademarks such as "BIONICK," page 48, line 16, "PHOTOMETRIC COOLED-CCD," page 48, line 35 and bridging over to page 49, line 1, "NYBOND," page 49, line 5, "RADPRIME," page 49, line 7, and so on, of the specification has been noted in this application. They should be capitalized wherever they appear and be accompanied by the generic terminology. Although the use of trademarks is permissible in patent applications, the propriety nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

6. Each letter of the trademarks must be capitalized. *See MPEP 608.01(V) and Appendix I.*

7. The disclosure is objected to because of the following minor informalities: There appears to be an extra parentheses, ')' on page 10, line 10. Appropriate action is required.

Claim Rejections - 35 U.S.C. § 101 and Claim Rejections - 35 U.S.C. § 112

8. 35 U.S.C. § 101 reads as follows:

"Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter or any new and useful improvement thereof, may obtain a patent therefore, subject to the conditions and requirements of this title".

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the Applicant regards as his invention.

10. Claims 1-10, 12, 20 and 30 are rejected under 35 U.S.C. 101 because the claimed invention is not supported by either a specific asserted utility or a well established utility.

11. The DS-CAM polypeptide encoded by the claimed nucleic acid has no disclosed specific utility. The Applicants have provided only prophetic examples that the disclosed nucleic acids, derived from a 14 week trisomy 21(Down Syndrome) fetal brain tissue sample, and identified using bacterial artificial chromosomes (BAC) and P1 artificial chromosomes (PAC; see page 47), which were themselves screened using yeast artificial chromosomes (YAC; see page 50) and the location of the PACs and BACs were confirmed using FISH (see page 50). From the PACs and BACs, contiguous sequences (contigs) were generated and gaps were filled using whole BACs (see pages 49-50). Variations of the method are disclosed on pages 50-55 and the sequences compared with known GenBank sequences (see page 55). The Applicants have only disclosed the expression of *homologous* sequences in various tissues using Northern blot hybridizations (see pages 57-62). The Applicants have provided insufficient evidence that the claimed nucleic acid sequence exists in nature, if the expressed protein is related to Down Syndrome clinically and have provided no stated utility for the nucleic acid or the expressed protein. Additionally, the claimed amino acid sequence (SEQ ID NO: 2) is encoded by AF042091 by only discontinuous stretches of the reference nucleic acid sequence, which is encodes peptides with 100% encoding matches, identified by a myriad of different functions and sequences, including Alu. It therefore is incredulous that the Applicants have only a DS-CAM, given the teaching of so many different functions attributed to the same reference sequence. It is also noted that given the high homology of the discontinuous stretches, that the reference sequence

would hybridize to the Applicants' probes, and thus, the hybridization data disclosed on pages 57-62, may not have identified a true DS-CAM. One of skill in the art would not be able to use the protein as disclosed given the lack of disclosure of how the expressed protein or nucleic acid could be used, even if the Applicants had provided the lacking evidence of a natural existence of the nucleic acid or its expressed polypeptide. If one of skill in the art were to detect the protein or claimed nucleic acid, it has not been disclosed what relevance, if any, said detection would have in the diagnosis or treatment of Down Syndrome, or in any other clinical condition. Thus the Applicants have failed to provided a specific utility for the claimed invention.

12. Claims 1-10, 12, 20 and 30 are also rejected under 35 U.S.C. 112, first paragraph. Specifically, since the claimed invention is not supported by either a specific asserted utility or a well established utility for the reasons set forth above, one skilled in the art clearly would not know how to use the claimed invention.
13. Claims 1-10, 12, 20 and 30 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.
14. Claims 1-10, 12, 20 and 30 recite the term "DS-CAM". It is improper to recite an abbreviation in the claims without an accompanying definition.
15. Claim 2 is indefinite in the recitation of: "DNA degenerate with respect to". It is unclear to what degree the degeneracy is intended, absent a clear definition in the specification, since the term has many different meanings within the art.
16. Claim 2 is indefinite in the recitation of "biologically active". Absent a sufficient definition of the phrase in the specification, it is unclear what activity Applicants intend to be encompassed by the claim.
17. Claim 3 is indefinite in the recitation of "high stringency". The term is defined in the specification only in exemplary form, and it is therefore unclear under which conditions the Applicants intend the claimed polynucleotide sequences to hybridize. This rejection could be overcome by listing the conditions disclosed on page 16 into the claim.
18. Claims 3-8 lack an antecedent basis for the limitation of "A nucleic acid". It is suggested that the Applicants reword the claims to "An isolated nucleic acid".
19. Claim 4 is indefinite in the recitation of "substantially the same". It is unclear which specific sequences the Applicants intend to be encompassed by the claim.

20. Claim 5 is indefinite in the recitation of "moderately stringent". The term is defined in the specification only in exemplary form, and it is therefore unclear under which conditions the Applicants intend the claimed polynucleotide sequences to hybridize. This rejection could be overcome by listing the conditions disclosed on page 16 into the claim.
21. Claim 9 is indefinite in the recitation of "specifically hybridizing". It is unclear under which conditions the Applicants intend the claimed polynucleotide sequences to hybridize. This rejection could be overcome by listing the conditions disclosed on page 16 into the claim.
22. Claim 12 lacks an antecedent basis for the phrase "the DS-CAM cDNA sequence". Claim 10 has no such recitation. It is suggested that the Applicants reword the phrase to "a DS-CAM cDNA sequence".
23. Claim 20 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted step is: a step to isolate or recover the protein.
24. Claim 20 lacks an antecedent basis for the recitation of "said DS-CAM protein" in line 3 of the claim. To overcome this rejection, Applicants could recite "said DS-CAM-related protein" as recited in line 1 of the claim.
25. Claim 30 lacks an antecedent basis for the phrase "said primers." It is suggested that the claim be reworded to recite: "said single strand DNA primers".

Claim Rejections - 35 U.S.C. § 102

26. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

- (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the Applicant for a patent.
- (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

27. Claims 1-3 are rejected under 35 U.S.C. 102(a) as being anticipated by Korenberg, et al. (*PNAS USA*, 91:4997-5001, 1994).
28. Korenberg, et al. teach an isolated nucleic acid obtained from patients with Down Syndrome (see the abstract and page 4997, col. 1, last paragraph and bridging over to

page 4998, col. 1). DS-CAM would inherently be encoded by nucleic acid taught by Korenberg, et al, absent evidence to the contrary. The isolated chromosomal DNA isolated for Southern blot analysis, as taught on page 4998 would also be expected to hybridize to SEQ ID NO: 1 under the recited conditions, absent evidence to the contrary. The limitation of claim 1 that the DS-CAM comprising at least 7 Immunoglobulin-like domains is an inherent property of the polypeptide encoded by the claimed nucleic acid and lends no patentable weight to the claim. Therefore, the reference teachings anticipate the claimed invention.

29. Claims 1-3, 6-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Genexpress cDNA Program (*GenBank*, Accession # F13426).
30. The F13426 sequence listing teaches a 309 bp fragment of nucleic acid which encodes a 103 amino acid fragment of SEQ ID NO: 2. The F13426 sequence listing teaches that the sequence fragment has a 95.1% identity with the nucleic acid sequence that encodes SEQ ID NO:2. The F13426 sequence listing also teaches the cDNA was cloned into a *lafmid BA* vector. The limitation of claim 1 that the DS-CAM comprising at least 7 Immunoglobulin-like domains is an inherent property of the full-length polypeptide encoded by the claimed nucleic acid and lends no patentable weight to the claim. Claim 8 is included because the *lafmid BA* vector was derived from the pEMBL vector, which is an *E. coli* to yeast shuttle plasmid vector and thus requires a host (recombinant) cell for storage and shipment as evidenced by ATCC Catalog No. 37395. The reference teachings thus anticipate the claimed fragments, vectors and host cells.
31. Claims 1-3, 6-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Genexpress cDNA Program (*GenBank*, Accession # Z41519).
32. The Z41519 sequence listing teaches a 321 bp fragment of nucleic acid that has a 99.1% identity with the bp residues nos. 6284-6604 of SEQ ID NO:1. The Z41519 sequence listing also teaches the cDNA was cloned into a *lafmid BA* vector. The limitation of claim 1 that the DS-CAM comprising at least 7 Immunoglobulin-like domains is an inherent property of the full-length polypeptide encoded by the claimed nucleic acid and lends no patentable weight to the claim. Claim 8 is included because the *lafmid BA* vector was derived from the pEMBL vector, which is an *E. coli* to yeast shuttle plasmid vector and thus requires a host (recombinant) cell for storage and shipment as evidenced by ATCC Catalog No. 37395. The reference teachings thus anticipate the claimed fragments, vectors and host cells.

Claim Rejections - 35 U.S.C. § 103

33. The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Subject matter developed by another person, which qualifies as prior art only under *subsection (f) or (g) of section 102* of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

34. Claims 1, 2, 10, 12, 20 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Genexpress cDNA Program (*GenBank, Accession # F13426*) or Genexpress cDNA Program (*GenBank, Accession # Z41519*) in view of Gallatin, et al., (US Patent No. 5,525,487).
35. # F13426 and Z41519 have been discussed, *supra*. # F13426 and Z41519 do not teach the claimed nucleotide which is detectably labelled, a kit comprising the nucleotide sequence, or a method for expression of a DS-CAM related protein, or DNA primers for amplification of the DS-CAM nucleic acid. However, the '487 patent teaches that in order to produce the polypeptide in large quantities, the host cells, can be used in a method of expressing the polypeptide then isolating the polypeptide from the cell culture medium, as recited in claim 20, (see col. 3, lines 12-17). The '487 patent additionally teaches DNA primers for amplification of the DS-CAM nucleic acid, as recited in claim 30 (see cols. 5 and 6). The '487 patent also teaches single-stranded ³²P-labelled detectably-labelled oligonucleotides, as recited in claim 10 in col. 7, line 44-46 and a single strand oligonucleotides would necessarily be in a composition comprising the oligonucleotides and the hybridization buffer (see col. 7, lines 45-50). One of ordinary skill in the art would recognize that a kit, recited in claim 12, comprising said oligonucleotide would allow for better standardization of the hybridization assay, especially given the requirements of clinical practice in medically-related laboratory diagnostic assays. One of ordinary skill in the art at the time the invention was made would have been motivated to use the DNA taught by # F13426 and Z41519 in a kit comprising the nucleotide sequence, or a method for expression of a DS-CAM related protein, or DNA primers for amplification of the DS-CAM nucleic acid, in order to produce large quantities of the protein as taught in col. 3, and in a method of hybridization to detect the DNA encoding the claimed polypeptide. From the combined teachings of the references, it is apparent that one of ordinary skill in the art would have had a reasonable expectation of success in producing the claimed invention. Therefore, the invention as a whole is *prima facie* obvious to one of ordinary skill in the art at the time the invention was made, as evidenced by the references, especially in the absence of evidence to the contrary.

Conclusion

36. Papers related to this application may be submitted to Group 1640 by facsimile transmission. Papers should be faxed to Group 1640 via the PTO Fax Center located in Crystal Mall 1. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). THE CM1 FAX CENTER TELEPHONE NUMBER IS (703) 305-3014 or (703) 308-4242.
37. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Mary Tung whose telephone number is (703)308-9344. The Examiner can normally be reached Tuesday through Friday from 8:30 am to 6:00 pm, and on alternating Mondays. A message may be left on the Examiner's voice mail service. If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Christina Chan can be reached on (703) 308-3973. Any inquiry of a general nature or relating to the status of this application should be directed to the Group 1640 receptionist whose telephone number is (703) 308-0196.

David A. Saunders
DAVID SAUNDERS
PRIMARY EXAMINER
ART UNIT-182/1644

August 13, 1999
Mary B. Tung, Ph.D.
Patent Examiner
Group 1640